

What is claimed is:

1. A method for recording in a nonvolatile solid-state magnetic field with a recording layer made of carrier induced ferromagnetic material, comprising the steps of:
  - applying a given magnetic field to said recording layer
  - applying a first electric field to said recording layer under said magnetic field,
  - and
  - applying a second electric field to said recording layer under said magnetic field so that a hole carrier concentration of said recording layer is reduced lower than at the application of said first electric field, to invert a magnetization of said recording layer and thus, realize recording operation for said recording layer.
2. The recording method as defined in claim 1, wherein said first electric field and said second electric field are applied alternately to said recording layer, to invert said magnetization of said recording layer alternately, and thus, realize successive recording operation for said recording layer.
3. The recording method as defined in claim 1, wherein an intensity of said magnetic field is set within a coercive force range of said recording layer during the application of said first electric field and said second electric field.
4. The recording method as defined in claim 1, wherein said carrier induced ferromagnetic material is carrier induced ferromagnetic semiconductor.
5. The recording method as defined in claim 4, wherein said carrier induced ferromagnetic semiconductor is at least one of (Ga, Mn)As and (In, Mn)As.
6. The recording method as defined in claim 1, wherein a thickness of said recording layer is set within 0.3-200nm.
7. The recording method as defined in claim 1, wherein an absolute intensity of said first electric field is set within 0-10MV/cm, and an absolute intensity of said second electric field is set larger than said absolute intensity of said first electric field.
8. The recording method as defined in claim 1, wherein said nonvolatile solid-state magnetic memory includes a given substrate to support said recording layer and a metallic electrode layer provided above said recording layer via an

insulating layer, thereby to complete an electric field effect transistor, and said recording layer functions as a channel layer and said metallic electrode layer functions as a gate electrode, whereby said first electric field and said electric field are applied to said recording layer via said metallic electrode layer.

9. The recording method as defined in claim 8, wherein said nonvolatile solid-state magnetic memory includes a buffer layer between said substrate and said recording layer.

10. The recording method as defined in claim 5, wherein said substrate is made of GaAs.